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Multiple basis wavelet denoising using Besov projection:

 Hyeokho Choi [Baraniuk, R.](#)

Dept. of Electr. & Comput. Eng., Rice Univ., Houston, TX, USA;

This paper appears in: Image Processing, 1999. ICIP 99. Proceedings. 1999 International Conference on

Meeting Date: 10/24/1999 - 10/28/1999

Publication Date: 1999

Location: Kobe Japan

On page(s): 595 - 599 vol.1

Volume: 1

Reference Cited: 13

Number of Pages: 4 vol.(Ixxix+676+977+952+449)

Inspec Accession Number: 6511861

Abstract:

Wavelet-based image denoising algorithm depends upon the energy compaction property of wavelet transforms. However, for many real-world images, we cannot expect good energy compaction in a single wavelet domain, because most real-world images consist of components of a variety of smoothness. We can relieve this problem by using multiple wavelet bases to match different characteristics of images. In this paper, we propose a novel image denoising algorithm that uses multiple wavelet bases. By establishing a relationship between the deterministic Besov space theory and the wavelet-domain statistical models, we generalize the Besov theory for finite sampled data. After defining convex sets in Besov spaces that contain the true image, we obtain an estimate of the true image by the method of projection onto convex sets. The algorithm outperforms existing multiple wavelet basis denoising algorithms; in particular, it shows excellent performance at low signal-to-noise ratios.

Index Terms:

[image restoration](#) [wavelet transforms](#) [Besov projections](#) [energy compaction](#) [finite sampled data](#) [image denoising](#) [wavelet denoising](#) [wavelet transforms](#)

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Multiscale contrast enhancement of medical images

Boccignone, G. Picariello, A.

Dipt. di Ingegneria dell'Inf. e Ingegneria Elettrica, Salerno Univ., Italy;

This paper appears in: Acoustics, Speech, and Signal Processing, 1997. ICASSP 97., 1997 IEEE International Conference on

Meeting Date: 04/21/1997 - 04/24/1997

Publication Date: 21-24 April 1997

Location: Munich Germany

On page(s): 2789 - 2792 vol.4

Volume: 4

Reference Cited: 7

Number of Pages: 5 vol. (xxii+xxv+xxiv+xxii+4156)

Inspec Accession Number: 5744670

Abstract:

We present results obtained by different contrast enhancement methods applied to medical images. We take into account classical histogram specification, local and wavelet-based techniques and a novel approach for multiscale contrast enhancement. The latter, whose rationale grounds in theories of visual perception, exploits a local definition of the Fechner-Weber's contrast within the context of a non-linear scale-sp representation generated by anisotropic diffusion. Our experimental fields concerns a difficult kind of medical images, namely digital mammographic images

Index Terms:

[diagnostic radiography](#) [image enhancement](#) [image representation](#) [medical image processing](#) [visual perception](#) [wavelet transforms](#) [Fechner-Weber's contrast](#) [anisotropic diffusion](#) [digital mammographic images](#) [experiment](#) [histogram specification](#) [local techniques](#) [medical image](#) [multiscale contrast enhancement](#) [nonlinear scale-space representation](#) [visual perception](#) [wavelet based techniques](#)

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1	S1	0	(multi adj scale) adj unsharp
2	S2	0	(multi adj scale) with unsharp
3	S3	2391	unsharp
4	S4	13	S3 same wavelet
5	S5	101	("5276515" "5861915" "4500634" "4969051" "5027202" "4322717" "4432610" "4503469" "4571604" "4606064" "4866520" "4868656" "4905149" "4910599" "4937677" "4951125" "5005459" "5179320" "5191441" "5274709" "5298990" "5396286" "5497192" "5513025" "5528378" "5574508" "5689436" "5694168" "5726766" "5768634" "5838817" "5845014" "5864787" "5883678" "5911007" "5933187" "6052487" "6088489" "6088486" "6108378" "6130913" "6154495" "6166770" "6222978" "6222978" "6236431" "6339479" "6351558" "6570673" "6608699").pn.
6	S6	0	S5 and wavelets
7	S7	9455	wavelet
8	S8	881	S7 same (smoothing or enhanc\$5 or sharp\$5)
9	S9	161	S8 same (decompos\$5 or (multi adj (resolution or scale)))
10	S11	2978	wavelet same coefficient\$1
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15	S16	5344	382/254-275.ccls.
16	S17	302	S16 and (wavelet or subband)
17	S18	5350	382/254-275.ccls.
18	S19	303	S18 and (wavelet or subband)
19	S20	155	S19 and (scale and (coefficient or factor))
20	S21	0	multiscale adj unsharp
21	S22	0	(multi adj scale) adj unsharp
22	S23	4	(multi adj resolution) adj unsharp
23	S24	18	(multi adj resolution) same unsharp
24	S25	45567	"382"/\$.ccls.
25	S26	685	S25 and wavelets
26	S27	2330	S25 and wavelet
27	S28	1419	S27 and (sharpen\$3 or smooth\$3 or enhanc\$5 or blur\$4)
28	S29	201	S27 and (sharpen\$3 or smooth\$3 or enhanc\$5 or blur\$4).ab.

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29	S30	24	S29 and (coefficient near (multipl\$5 or scal\$4))
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31	S32	10827	wavelet
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38	S39	128	berkner.in.
39	S40	12	berkner-kathrin.in.
40	S41	5	((("6263120") or ("5717789") or ("5883973") or ("5805721") or ("5867606")).PN.
41	S42	77	unsharp and pyramid
42	S43	50	complex adj wavelet
43	S44	12	complex adj wavelet adj transform
44	S45	7	overcomplete adj wavelet adj transform
45	S46	5	((("5717789") or ("5883973") or ("5805721") or ("5867606") or ("6263120")).PN.